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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,162	12/08/2003	Yushi Ono	4444-032065	2307

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EXAMINER	
LUKS, JEREMY AUSTIN	
ART UNIT	**PAPER NUMBER**
2837	
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05/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,162	ONO ET AL.	
	Examiner	Art Unit	
	JEREMY LUKS	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 14, 15 and 17 are objected to because of the following informalities: Applicant has claimed a woven fabric of polyethylene naphthalate fiber, wherein the polyethylene naphthalate fiber is an untwisted fiber. If the fiber has been woven, then the fibers would inherently be twisted. It is unclear whether Applciant is referring the the individual fibers as being untwisted, or the base layer of woven fabric is untwisted. Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the woven fabric containing untwisted fiber must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4, 6-8, 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Mizone (7,123,738) and Bost (4,078,160). Ward teaches a loudspeaker diaphragm comprising a base layer (Figure 1, #11) having a woven fabric of a fiber impregnated with a thermosetting melanine resin (Col. 1, Lines 51-53), whereby the fiber is coated with a second thermosetting resin (Col. 2, Lines 56-58) containing a thermoplastic elastomer (Col. 2, Lines 5-12). Ward fails to teach wherein the base is made of polyethylene naphthalate, and wherein the polyethylene naphthalate fiber is an untwisted fiber. Mizone teaches a base layer made of a polyethylene naphthalate fiber impregnated (Col 1, Lines 26-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward, with the apparatus of Mizone to provide a speaker

diaphragm that is light weight, provides larger internal loss, is excellent in rigidity and provides excellent sound quality. Bost teaches a diaphragm having a woven base made of an untwisted fiber monofilament (Figures 3 and 4, #35) (Col. 3, Lines 59-63). The Examiner notes that it is well know that a monofilament fiber is untwisted as defined by the Merriam-Webster dictionary in the attached NPL document. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Bost to provide a base material that is very thin to easily obtain a flexing of the diaphragm. Ward, Mizone and Bost fail to teach a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20 by weight. However, It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a fiber/resin ratio in the base layer in the range of 60/40 to 80/20 by weight, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working range involves only routine skill in the art. In re Aller, 105 USPQ 233. Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Still Further, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

4. Claims 9-12 and 15-17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) in view of Mizone (7,123,738), Bost (4,078,160) and Kanada (US 2002/0045040). Ward teaches a loudspeaker diaphragm comprising a base layer (Figure 1, #11) having a woven fabric of a fiber impregnated with a thermosetting

melanine resin (Col. 1, Lines 51-53), whereby the fiber is coated with a second thermosetting resin (Col. 2, Lines 56-58); and curing the thermosetting resin, so as to form a base layer (Col. 2, Lines 33-38). Ward fails to teach wherein the base is made of polyethylene naphthalate,; and wherein the polyethylene naphthalate fiber is an untwisted fiber; a thermoplastic elastomer layer; adding the inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and laminating the base layer and the thermoplastic resin layer; a thermoplastic elastomer layer containing at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer; and a foamed structure, wherein an average diameter of a cell in the foamed structure is 10 to 60 μm. Mizone teaches a base layer made of a polyethylene naphthalate fiber impregnated (Col 1, Lines 26-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward, with the apparatus of Mizone to provide a speaker diaphragm that is light weight, provides larger internal loss, is excellent in rigidity and provides excellent sound quality. Bost teaches a diaphragm having a woven base made of an untwisted fiber monofilament (Figures 3 and 4, #35) (Col. 3, Lines 59-63). The Examiner notes that it is well know that a monofilament fiber is untwisted as defined by the Merriam-Webster dictionary in the attached NPL document. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Bost to provide a base material that is very thin to easily obtain a flexing of the diaphragm. Kanada teaches a thermoplastic elastomer

layer (Page 2, [0014]); adding the inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and laminating the base layer and the thermoplastic resin layer (Page 2, [0018]); a thermoplastic elastomer layer containing at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer (Page 2, [0014]); and a foamed structure (Page 3, [0021]), wherein an average diameter of a cell in the foamed structure is 10 to 60 μm (Page 3, [0026]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Kanada in order to provide a laminate that is thin and has excellent flexibility, while maintaining a high level of soundproofing characteristics.

5. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098), Mizone (7,123,738), Bost (4,078,160) and Kanada (US 2002/0045040) as applied to claim 17 above, and further in view of Yamaji (5,055,341). Ward, Mizone, Bost and Kanada are relied upon for the reasons and disclosures set forth above. Ward, Mizone, Bost and Kanada fail to teach a thermoplastic resin layer composed of a film; and the thermoplastic elastomer constituting the thermoplastic elastomer layer having a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer. Yamaji teaches a thermoplastic resin layer as an intermediate layer composed of a film (Col. 5, Lines 57-61); and the thermoplastic elastomer constituting the thermoplastic elastomer layer having a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer (Col. 6, Lines

23-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Yamaji because of their lightweight and heat resistant characteristics, as well as high productivity at a low cost.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098), Mizone (7,123,738) and Bost (4,078,160) as applied to claim 1 above, and further in view of Thomas (EP 0508596 A1). Ward, Mizone and Bost are relied upon for the reasons and disclosures set forth above. Ward, Mizone and Bost fail to disclose a base layer comprising an unwoven fabric of a liquid crystal polymer. Thomas discloses a base layer comprising an unwoven fabric of a liquid crystal polymer (Col.1, Lines 34-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Thomas because a liquid crystal polymer provides substantially better resistance to moisture and to elevated temperature than traditional materials, as well as its good fatigue resistance to survive the rigors of high output sound reproduction over extended periods of time.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ward (4,076,098) and Mizone (7,123,738) and Bost (4,078,160), as applied to Claim 4 above, and further in view of Inoue (6,378,649) and Ogura (5,744,761). Ward, Mizone and Bost are relied upon for the reasons and disclosures set forth above. Ward, Mizone and Bsot fail to teach a thermosetting resin as an unsaturated polyester resin and a second thermosetting resin as an epoxy resin or a melamine resin. Inoue discloses a thermosetting resin as an unsaturated polyester resin (Col. 3, Lines 11-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to

combine the apparatus of Ward as modified, with the apparatus of Inoue for their high elasticity and large internal loss, while providing excellent flexibility. Inoue fails to disclose a second thermosetting resin as an epoxy resin or a melamine resin. Ogura disclose a second thermosetting resin as an epoxy resin or a melamine resin (Col. 5, Lines 27-32). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Ogura because they are sufficient to impart stiffness on a cloth after cooling to ambient temperatures.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 2 and 4-20 have been considered but are moot in view of the new ground(s) of rejection. The Examiner considers the obvious combination of Ward, Mizone, Bost, Kanada, Yamaji, Thomas, Inoue and Ogura to teach all of the limitations as claimed by Applicant.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pertinent arts of record relating to loudspeaker diaphragms are disclosed in the PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy Luks whose telephone number is (571) 272-2707. The examiner can normally be reached on Monday-Thursday 8:30-6:00, and alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on (571) 272-1988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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